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## ABSTRACT

One of a series of curriculum guides prepared for the graphic communications occupations cluster, this guide identifies the essentials of the graphic arts trade as recommended by the successful printers. An instructional program based upon the implementation of the guide is expected to prepare a student to adequately perform entry level tasks required of a printer or to enter a post-secondary technical or apprenticeship program in graphic arts where additional depth can be realized. Trade tasks or information are listed in chart form under the headings of safety, copy preparation, composition, letter press, camera (offset), stripping and plating, offset press, bindery, and silkscreen. Space is provided on the charts to record for each item the date completed, teaching methods used, and teaching materials used. Also included are a list of teacher responsibilities, sources of occupational information, recommended tests and references, and a chart depicting the total graphic communication occupational curriculum. A typical application for employment and a sample trade and industrial education injury report are appended.

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TRADE AND INDUSTRIAL EDUCATION

TRADE PREPARATORY TRAINING GUIDE

GRAPHIC ARTS

U.S. DEPARTMENT OF HEALTH,  
EDUCATION & WELFARE  
NATIONAL INSTITUTE OF  
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## DEFINITIONS USED IN THIS GUIDE

### **Major Occupational Group**

A grouping of similar and related occupational area clusters. These groups include occupations that have been determined to be the most relevant and pertinent for inclusion in vocational education in Nebraska.

### **Occupational Area Clusters**

These clusters are distinguishable in terms of similar work performed, materials used, products produced, and/or services rendered. They include a wide variety of common occupational skills and knowledge.

### **Occupation**

The career or employment engaged in by an individual for remuneration. This activity includes technical competencies and related technical information often referred to as one's vocation.

### **Technical Competency**

The specific tasks required for a vocational trade and industrial graduate to perform successfully at the entry level in an occupational area. These technical competencies apply to the psychomotor domain and include elements which emphasize motor skills such as: operate a machine; measure; etc.

### **Related Technical Information**

The information the entry level worker must know in order to make appropriate trade decisions which will allow him to adequately perform the tasks or technical competencies of his occupation. This information applies to the cognitive domain and includes elements which are intellectual outcomes such as: knowledge and understanding.

### **Related General Information**

Information which is desirable and good for the tradesman to know but which is not necessary to do his work properly; information that is nice to know, such as the history and development of his trade.

### **Related Guidance Information**

Information that helps the student choose, prepare for, secure, hold, and make progress in an occupation.

### **Entry Level**

The technical competencies and related technical information deemed necessary by industry for obtaining and holding a job in a specific occupational area. This level of employment includes the technical competencies and related technical information that will be utilized by the employee within the first year of employment.

## OCCUPATIONAL ANALYSIS CHART

The chart on this page shows Graphic Arts as it relates to other occupations within Graphic Communication cluster. Graphic Arts Occupations is one of two clusters which is a part of the major occupational group entitled Graphic Communication. This guide is concerned with Graphic Arts only. Other guides have been prepared for each of the occupations found in this chart and are available through the Nebraska State Department of Education.

### OCCUPATIONAL ANALYSIS CHART (ST MODEL)

#### GRAPHIC COMMUNICATION

DRAFTING  
OCCUPATIONS

GRAPHIC ARTS  
OCCUPATIONS

DRAFTING

GRAPHIC ARTS

This curriculum guide has been prepared with the help of competent craftsmen in the graphic arts trade. The funds that made this guide a reality were provided through a federal research grant in cooperation with the Nebraska State Board for Vocational Education and Training by the National Research Coordinating Unit.

Curriculum guides have been prepared for several trade and industrial occupational clusters from which high school teachers can develop appropriate occupational related experiences for their students. The major occupational groups, occupational area clusters, and occupations are shown in graphic form on pages of this guide.

Selection of trades within four major occupational groups have been made based on a three year survey by the Nebraska Research Coordinating Unit on needs of Nebraska business and industry. This study has identified the occupations with the greatest need for employees. A related set of curriculum guides have been prepared for these occupations.

#### Guidance Information

The U.S. Department of Labor has developed an extremely helpful book entitled, "Occupational Outlook Handbook." This annual publication provides a very complete description of the activities of the persons employed in the occupations represented in the Nebraska trade and industrial curriculum guides. Information concerning current and future opportunities is a major portion of this publication. Inexpensive reprints in booklet form that describe individual occupations are available through the Department of Labor. These booklets should be used by trade and industrial teachers and school guidance counselors for the most up-to-date guidance information about a particular occupation.

A listing of these reprints from the "Occupational Outlook Handbook," the order number, and price per copy is listed below for those occupations in the occupational area cluster of "Graphic Communications."

<u>Number</u>	<u>Title</u>	<u>Price</u>
1700-109	Printing Occupations . . . . .	.20
1700-28	Technicians-Draftsmen. . . . .	.15
1700-29	Architects . . . . .	.10

## The Graphic Arts Guide

This guide uses the title Graphic Arts as the most logical descriptive term for identifying a particular related group of workers. Identification of specific job titles within this group would be determined by referring to the "Dictionary of Occupational Titles." The USOE classification system for coding instructional programs has assigned 650.682, 654.782, and 973.381 to the instructional program, Graphic Arts.

The information within this guide identifies the essentials of the graphic arts trade as recommended by the successful printers. An instructional program based upon the implementation of this guide will prepare a student to adequately perform entry level tasks required of a printer or to enter a postsecondary technical or apprenticeship program in graphic arts where additional depth can be realized.

The tasks and/or competencies identified within these covers are those agreed upon by a jury of reputable Nebraska printers. A separate group of persons directly employed within this trade in Nebraska have further verified these tasks and/or competencies. Jury members, tradesmen, and educators who contributed toward the development of content for this guide are listed in the front.

Course offerings in trade and industrial education in Nebraska are to be organized within two period blocks of time each day, five days a week. Time is to be set aside for classroom instruction directly related to manipulative laboratory instruction. The remainder of the student's school day is to be utilized for general education subjects.

## USE OF THIS GUIDE

The use of curriculum guides for trade and industrial education in Nebraska secondary schools may vary greatly, depending upon the depth and breadth of each school district's vocational program. Large school districts, for example, may utilize one particular curriculum guide to develop a course in a trade area such as graphics arts. A small school district may, on the other hand, incorporate several curriculum guides to develop a course in the graphic arts occupational cluster.

The manipulative content identified in this guide is deemed necessary for inclusion in a course that is designed to prepare entry level graphic art workers. While not all secondary school facilities in Nebraska are equipped to expose students to all of this content through hands-on experience, it is assumed that this content will through some media become related technical information. This will insure inclusion of all content and provide at least discussion level understanding.

This guide is written with the assumption and expectation that the related technical information necessary to perform technical competencies will be an integral part of instruction. Thus, occupational decisions that must be made by an entry level worker will be developed along with each related manipulative activity.

The graphic instructor who uses this guide is responsible for including the identified related technical information as well as the identified manipulative tasks. He is also responsible for the identification of competencies pertaining to general guidance information, even though this information is not specifically identified for him.

Definitions for various terms used in this guide are presented in the front.

## TEACHER RESPONSIBILITIES\*

1. Use the American Vocational Association National Safety Council's "National Standards School Shop Safety Inspection Check List" for shop safety inspections. (Available from American Vocational Association, 1510 "H" Street, N.W., Washington, D.C. 20005)
2. Use safety check list to assure safe factors exist.
3. Require students to report ALL accidents to instructor.
4. Keep complete records of ALL accidents on file.
5. Report ALL accidents to the school administrator.
6. Develop safety consciousness in the students through teacher example--always doing things in the safe way.
7. Give shop demonstrations stressing safe use of machines.
8. Give shop demonstrations stressing safe use of hand tools.
9. Provide instruction on what to do in case of an accident.
10. Develop information sheets dealing with the safe use of specific machines.
11. Give demonstrations on the proper use and care of personal protective devices.

\*These responsibilities are necessary for inclusion in all trade and industry programs in the State of Nebraska.

12. Develop information sheets dealing with the general safety rules for the trade.
13. Enclose all gears, moving belts, and other power transmission devices with permanent guards.
14. Prohibit students from operating machines when instructor is not present.
15. Prohibit the removal of guards and safety devices, even for a brief period, without the approval of the instructor.
16. Prohibit more than one operator from using a machine at one time.
17. Determine personal liability factors and liability coverage afforded through your school.
18. Provide for the bulk storage of flammable materials.
19. Mark the location of fire-fighting equipment.
20. Post instructions and inform students of building evacuation procedures.
21. Require the wearing of appropriate eye protection as specified by the State of Nebraska eye safety regulations.
22. Keep tools sharp, clean and in good working condition.
23. All shop personnel should be thoroughly familiar with the location of fire extinguishers and the type fire for which each extinguisher is designed.

**GRAPHIC ARTS CONTENT**

(Identified Trade Tasks or Information)

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
SAFETY			
Follow shop rules, regulations, and procedures.			
Conduct operations in a safe manner.			
Exercise care and respect for all tools and equipment.			
COPY PREPARATION			
Accomplish measurements within acceptable tolerances.			
Transpose standard measurements (inches) to printing measures (points, picas).			

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
Scale and mark art for camera.			
Detect flaws in type proofs, photostats, and photographs and make corrections.			
Execute a layout when given copy, art, intent, and mechanical requirements.			
Wax or rubber cement type proofs and photostats.			
Rule out bleed, trim, fold and other key or holding lines.			
Cut type proofs and			

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
<p>Layout and execute mechanicals for work involving solids and tints (overlaid and butted), dropouts, reverses, combined tints, and similar operations.</p>			
<p>Use and/or maintain:</p>			
<p>line guage</p>			
<p>film cutter</p>			
<p>shears</p>			
<p>brushes</p>			
<p>inks</p>			
<p>pens</p>			

masks for use in the color separation process.

Make the continuous tone separation negatives from colored transparent copy.

Make the screened positives from a set of continuous tone separation negatives.

52 Make contact negatives from color separated positives.

Use and/or maintain:

camera

film

darkroom

lights

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
processing chemicals			
process camera			
ortho, pan, duplicating and auto positive film			
black and white line copy			
colored line copy			
colored filters			
black and white photo- graphs			
halftone screen			
contact frame and		28	

register punch

vacuum frame

masking film and  
matching chemicals

color compensating  
filters

27

color separation  
filters

pre-angled screens

diffusion sheets

inspection glass

#### STRIPPING AND PLATING

Rule out flats for black  
and white printed forms.

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
Strip both line and half-tone negatives into flats.			
Strip work and turn forms.			
Strip tumble-head forms.			
Strip butted negatives.			
Opaque negatives.			
Scribe line forms on negatives			
Strip sets of color negatives in register.			
Strip sets of color positives in register.			
Determine proper exposure		30	

time for any offset plate.

Expose and process posi-  
tive working offset plates.

Prepare, expose, and pro-  
cess rub-on type offset  
plates.

Finish and preserve all  
types of offset plates.

29

Use and/or maintain:

scotch tape

goldenrod masking paper

plate burner

rub-on table

exposure quide

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
gum arabic			
OFFSET PRESS			
Pull reproduction proofs from type high forms on the proof press.			
Make salt prints, brown prints, or van dyke proofs.			
Make high contract re- production proofs from photographic paper.			
Make positive process reproduction proofs to size.			
Make dry proofs using the heat process.		32	

Set-up and operate feeder  
of duplicator for full  
range of stocks.

Mount plate and obtain  
lay.

Print a range of stock  
in black/white to commer-  
ical standards using dup-  
licator.

Print two color work on  
duplicator.

Print screens of 120  
lineature to 70% using  
duplicator.

Make all normal pressure  
settings on duplicator.

Set inking and water  
rollers on duplicator.

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
Gum and store plates.			
Handle paper, metal and electrostatic plates.			
Organize work schedule for production efficiency.			
Maintain operating log for down time utilization.			
Set-up and operate offset press through complete range of stock.			
Print black/white work to all commercial standards of color, register, speed and waste on offset presses.			
		34	

Print multi-color work on offset press.

Print solids and reverses on offset press.

Set printing pressures for offset presses.

Pull solids and breakaways.

ω Pull and analyze register and print test sheets.

Set ink and water rollers on offset press.

Use and/or maintain:

brown print paper

hypo crystals

positive processor

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
high contrast photographic proof paper and developer			
duplicator			
single color press			
multi color press			
Bindery			
Figure stock cuts.			
Select specified stocks.			
Plan cut sequence.			
Organize materials flow.			
Split gauges.		36	

Change and adjust blades.

Set-up and operate folder  
for:

letter fold, to 32 pages

accordion folds to 32  
pages

right angle folds, to  
32 pages

parallel folds, to 32  
pages

oblong folds, to 32  
pages

splitting

perforating

scoring

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
gluing			
continuous feed operation			
Set-up stitching machine for a specific job.			
Accomplish desired stitch- ing operation.			
Assemble sheets in number- ical sequence.			
Gather signature to place them in the proper order.			
Use and/or maintain:			
guillotine cutter			
buckle type folder			
		38	

hand operated stitcher

foot operated stitcher

automatic stitchers

collating machine

## SILKSCREEN

Assemble a silk screen frame with hinges, base, kickleg, or counterbalance device, register guides, and silk-rack stops.

Stretch silk and seal.

Build squeegee sharpening jig and sharpen squeegee.

Make tusche and glue stencils for one and more colors.

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
Cut paper stencils for one or more colors.			
Cut and adhere lacquer and glatin film stencils for one or more colors.			
Make hard drawn rubylith and photographic positives.			
Adhere photographic film to screen.			
Match to layout, estimate quantity and mix ink.			
Use hand squeegee, feed print, and take off paper and board materials.			
Check proof and repair			

screen.

Hang, rack, or process.

Clean up screen and squeegee,  
scavenge, store and catalog  
unused ink.

Construct simple jigs for  
printing thick material  
and for printing on cylin-  
drical surfaces.

Use and/or maintain:

screen printing silk

squeegees

solvent-soluble tusche

water soluble block-out

lacquer and gelatin  
film materials

TRADE TASK OR INFORMATION	DATE COMPLETED	TEACHING METHODS USED	TEACHING MATERIALS USED
photographic presen- itized film and chemicals.			
direct screen emulsion and ammonium			
stencil paper			
adhering liquid for lacquer films			
transparent extender base, clear mixing			
varnish, thinners, and washup solvents			
oil base flat poster inks		42	

## Appendix A

One of the primary objectives of trade and industrial education is the successful placement of students completing course work in a specific occupation. The following sample application form is included in this guide with the recommendation that the preparation of such forms become a necessary activity for students in all trade and industrial education courses.

<b>APPLICATION FOR EMPLOYMENT</b>					
PERSONAL INFORMATION			SOCIAL SECURITY NUMBER		
NAME	LAST	FIRST	MI		
PERMANENT ADDRESS	STREET		CITY	STATE	
PERMANENT ADDRESS	STREET		CITY	STATE	
PHONE NO.	OWN HOME	BENT	BOARD		
DATE OF BIRTH	HEIGHT	WEIGHT	COLOR OF HAIR	COLOR OF EYES	
MARRIED	SINGLE	WIDOWED	DIVORCED	SEPARATED	
NUMBER OF CHILDREN	PARENTS OTHER THAN WIFE OR CHILDREN		CITIZEN OF U. S. A. YES <input type="radio"/> NO <input checked="" type="radio"/>		
IF RELATED TO ANYONE IN OUR EMPLOY STATE NAME AND DEPARTMENT	REFERRED BY				
<b>EMPLOYMENT DESIRED</b>					
POSITION	DATE YOU CAN START		SALARY DESIRED		
ARE YOU EMPLOYED NOW?	IF NO MAY WE INQUIRE OF YOUR PRESENT EMPLOYER				
EVER APPLIED TO THIS C.	REPOREL	WHERE	WHEN		
<b>EDUCATION</b>					
GRAMMAR SCHOOL	NAME AND LOCATION OF SCHOOL		YEARS ATTENDED	DATE GRADUATED	SUBJECTS STUDIED
HIGH SCHOOL					
COLLEGE					
TRADE BUSINESS OR CORRESPONDENCE SCHOOL					
SUBJECTS OR SPECIAL STUDY OR RESEARCH WORK					
WHAT FOREIGN LANGUAGES DO YOU SPEAK FLUENTLY?			READ	WRITE	
U. S. MILITARY OR NAVAL SERVICE	RANK	PRESENT MEMBERSHIP IN NATIONAL GUARD OR RESERVE			
CONTINUED ON OTHER SIDE					

**FORMER EMPLOYERS** (LIST FIVE BELOW LAST FOUR EMPLOYERS, STARTING WITH LAST ONE FIRST)

DATE MONTH AND YEAR	NAME AND ADDRESS OF EMPLOYER	SALARY	POSITION	REASON FOR LEAVING
FROM				
TO				
FROM				
TO				
FROM				
TO				
FROM				
TO				

**REFERENCES:** GIVE BELOW THE NAMES OF THREE PERSONS NOT RELATED TO YOU, WHOM YOU HAVE KNOWN AT LEAST ONE YEAR.

NAME	ADDRESS	BUSINESS	YEARS ACQUAINTED
1			
2			
3			

**PHYSICAL RECORD:**

LIST ANY PHYSICAL DEFECTS

WERE YOU EVER INJURED?

GIVE DETAILS

HAVE YOU ANY DEFECTS IN HEARING?

IN VISION

IN SPEECH

IN CASE OF  
EMERGENCY NOTIFY

NAME

PHONE NO.

I AUTHORIZES INVESTIGATION OF ALL STATEMENTS CONTAINED IN THIS APPLICATION. I UNDERSTAND THAT MISREPRESENTATION OR OMISSION OF FACTS CALLED FOR IS CAUSE FOR DISMISSAL. FURTHER, I UNDERSTAND AND AGREE THAT MY EMPLOYMENT IS FOR NO DEFINITE PERIOD AND MAY, REGARDLESS OF THE DATE OF PAYMENT OF MY WAGES AND SALARY, BE TERMINATED AT ANY TIME WITHOUT ANY PREVIOUS NOTICE.

DATE

SIGNATURE

DO NOT WRITE BELOW THIS LINE

DATE

INTERVIEWED BY

REMARKS:

NEATNESS		CHARACTER	
PERSONALITY		ABILITY	

HIREO	FOR DEPT	POSITION	WILL REPORT	EX. ART W. A. T.
APPROVED	EMPLOYMENT MANAGER		DEPT. HEAD	GENERAL MANAGER

## **Appendix B**

One of the most important parts of any trade and industrial education course is a safety program. The following form is recommended for use in courses of this type.

### **SAMPLE TRADE AND INDUSTRIAL EDUCATION INJURY REPORT\* \*\***

Student \_\_\_\_\_ Date \_\_\_\_\_

Shop in which incident occurred \_\_\_\_\_ Time \_\_\_\_\_

Instructor in charge \_\_\_\_\_

Nature of injury \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

First aid administered \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ By whom? \_\_\_\_\_

Cause of injury \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Could injury have been prevented? \_\_\_\_\_ How? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action taken or recommendations made to prevent recurrence \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signed \_\_\_\_\_  
(Person making report)

Witnesses: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Names \_\_\_\_\_  
and \_\_\_\_\_  
Addresses \_\_\_\_\_

\*Complete in Duplicate  
\*\*File one copy in office

Graphic Arts

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